The Miwa reference

U.S. Patent No. 5,640,160 to Miwa is used to assert claim rejections under 35 USC 102(b); 35 USC 103(a) -- where Miwa is the sole reference; and 35 USC 103(a) -- where Miwa is the primary reference used in combination with one or more secondary reference(s). Applicant submits that all pending claims distinguish over Miwa, either alone or in combination with the teachings of other cited references.

Fundamentally, Miwa does not teach or suggest data encoding using biphase pulses. A biphase pulse is a pulse waveform having two appositive phase components offset so as to mitigate any DC component within the resultant signal. Miwa lacks this disclosure. What Miwa does disclose, however, is a pulse modulation method that couples constant-amplitude, constant-width pulses with pulse stop intervals of varying duration. This method of modulation is different from the biphase pulse encoding as claimed by Applicant.

Claim Rejections – 35 U.S.C. § 102(b)

Claims 1, 8, 14 and 16 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Miwa. Applicant respectfully traverses. As discussed above, Miwa does not teach or suggest data encoding using biphase pulses. Characterizing the pulse in Miwa's pulse modulation method (a constant-amplitude, constant-width pulse followed by a stop interval) as a biphase pulse is untenable in that Miwa does not disclose pulse signals as dropping below the zero-axis. By not incorporating a signal level below the zero-axis into the modulation method, Miwa lacks the requisite physicality to perform the biphase function. Accordingly, Applicant submits that claims 1, 8, 14 and 16 distinguish over Miwa and are thus allowable. Note that Applicant's claim 16 recites the

biphasic pulse width as representing a second set of data bits. Miwa actually teaches away from this limitation in that Miwa discloses the pulse width as specifically not containing information. *See* Miwa, col.3, lines 17-18 ("[s]ince the width of the pulse does not contain any transmission information . . . "); *see* Miwa, Fig.2 (the pulse width column is held constant at width "t" and thus, in and of itself, lacks the requisite degrees of freedom to encode digital data, which requires a minimum of two states.)

Claim Rejections – 35 USC § 103(a)

Claims 7 and 17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Miwa. Applicant respectfully traverses. As discussed above, Miwa does not teach or suggest data encoding using biphase pulses. Thus, independent claims 1 and 8 are allowable over Miwa. Claim 7 depends from claim 1, and claim 17 depends from claim 8. Accordingly, claims 7 and 17 are allowable for being dependent upon an allowable base claim.

Claims 2-4, 6 and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Miwa in view of U.S. Patent No. 3,863,025 to Gonsewski et al. Applicant respectfully traverses. As to claims 2-3 and 18, Miwa in view of Gonsewski does not teach or suggest an encoded bit stream of biphase pulse waveforms comprising alternate assignment of even and odd type biphasic pulses as claimed by Applicant. Figure 3 of Gonsewski is illustrative. Figure 3 discloses a data signal consisting of a series of digital values transmitted as biphase pulses. Each biphase pulse represents a "0" or "1" wherein a "0" is encoded using a negative pulse immediately followed by a positive pulse, and a "1" is encoded by a positive pulse followed immediately by a negative pulse.

This relationship is static, as evinced by the consecutive "0" pulses shown in Figure 3, and described in the text at col.2, lines 3-7. The biphase pulses as claimed by Applicant, however, alternate odd and even regardless of the value encoded. Recall that an odd type biphasic pulse occurs when a positive pulse precedes a negative pulse, and an even type biphasic pulse occurs when a negative pulse precedes a positive pulse (*see* Applicant's specification at page 5, lines 10-12.) Applicant refers to this alternating odd and even signaling as "Alternate Mark Inversion" (AMI). By using AMI, Applicant is able to increase the reliability of detection by reducing interference between consecutive biphasic pulses. AMI is an improvement over the prior art. Gonsewski does not teach or suggest this technique of encoding. Accordingly, claims 2-4, 6 and 18 are allowable over Miwa in view of Gonsewski.

Claims 4 and 6 each depend from independent claim 1. As discussed above, claim 1 is allowable over the cited prior art. Accordingly, claims 4 and 6 are allowable for being dependent upon an allowable base claim. Furthermore, with respect to claim 6, neither Miwa nor Gonsewski teach or suggest pulse width as representing a second set of data bits, and, as discussed above, Miwa actually teaches away from this limitation.

Claim 15 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Miwa in view of U.S. Patent No. 6,212,230 to Rybicki et al. Applicant respectfully traverses. As discussed above, claim 8 is allowable over the cited prior art. Claim 15 depends from claim 8. Accordingly, claim 15 is allowable for being dependent upon an allowable base claim. Further, the Action relies upon Rybicki to address the limitation of Applicant's claim 15 directed to amplitude encoding. However, Rybicki discloses an amplitude encoding scheme unlike

that recited by Applicant. Rybicki discloses a hybrid scheme wherein the least significant eight bits of the data are encoded using a pulse encoder, whereas the three most significant bits are encoded using an amplitude encoder. *See* col. 22, line 58 to col. 24, line 30. With respect to Figure 27, Rybicki discloses amplitude adjustment based on the number of pulses in the pulse pattern. With respect to Figure 28, Rybicki discloses a method of amplitude encoding wherein the amplitude of a particular pulse of the encoded signal is adjusted based upon the combined bits to be encoded. Each of these encoding methods is entirely unlike that as claimed by Applicant. Applicant discloses a technique that divides the amplitude of each biphasic pulse into a plurality of voltage levels. This technique of encoding provides the capability to carry one or more additional bits of data in a single pulse. Thus, the cited references do not teach or suggest Applicant's recitation in claim 15, either alone or in combination. Accordingly, claim 15 is allowable over Miwa in view of Rybicki.

Claim 5 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Miwa in view of Gonsewski as applied to claim 4, in further view of Rybicki. Applicant respectfully traverses. As discussed above, claim 1 is allowable over the cited prior art. Claim 5 depends from claim 1. Accordingly, claim 5 is allowable for being dependent upon an allowable base claim. Further, the cited references do not teach or suggest Applicant's technique of amplitude encoding. Thus, claim 5 is allowable over the references cited.

Conclusion

In view of the above, Applicant submits that the present application is in condition for allowance, and would appreciate early notification of the same.

Marked-Up Pages

This amendment and response does not present amendments to the specification or existing claim numbers. Accordingly, no separate pages of a marked-up version are attached hereto.

Invitation for a telephone interview

The Examiner is invited to call the undersigned at 408-720-8300 if there remains any issue with allowance of this case.

Deposit Account

Although a fee is not believed to be due by submission of this paper, authorization is hereby made to charge any fees due or outstanding, or credit any overpayment, to our Deposit Account No. 02-2666.

Respectfully submitted,

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